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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of	)	
	)	
Federal-State Joint Board on Universal Service	)	CC Docket 96-45
	)	
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs.	)	CC Docket 97-160

JOINT COMMENTS OF BELLSOUTH CORPORATION, BELLSOUTH TELECOMMUNICATIONS, INC., US WEST, INC., AND SPRINT LOCAL TELEPHONE COMPANIES TO FURTHER NOTICE OF PROPOSED RULEMAKING SECTIONS III.C.2

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I. INTRODUCTION

In this round of comments, the Commission has asked for comment on the issue of outside plant investment. As the Commission correctly noted at paragraph 55 of the Further Notice of Proposed Rulemaking in this matter, outside plant investment touches every part of an incumbent local exchange carrier's network infrastructure connecting the wire center to customer locations. Recognizing the importance of this element to the building of a credible proxy cost model, BellSouth, US WEST and Sprint - the Joint Sponsors of the Benchmark Cost Proxy Model ("BCPM") - have enhanced BCPM in a manner consistent with many of the Commission's tentative conclusions. In this filing, the Joint Sponsors offer both a narrative describing these enhancements as well as the answers to the Commission's specific questions on outside plant investment.

Initially, the Joint Sponsors note that, during the life of this docket, there have been numerous filings and *ex parte* presentations on the question of outside plant investment. In order to both facilitate and enhance this process, the Joint Sponsors strongly suggest that the Commission incorporate the information contained in these filings as a part of the record in this matter.

With respect to the instant filing, the Joint Sponsors note that, while many of the Commission's questions referred to inputs, the responses provided herein do not include comments regarding any specific inputs. The Joint Sponsors believe that the proper time to address the issue of inputs is in the final round of comments to be filed in this matter on October 17, 1997.

Neither do the Joint Sponsors provide extensive comment of the Commission's wireless questions for the simple reason that we have not conducted specific studies to determine the cost-effectiveness of a wireless solution. The Joint Sponsors are, however, anxious to consider the comments of others on the wireless issue and will provide reply comments if appropriate.

Finally, the Joint Sponsors are pleased to inform the Commission that, in early October, a Beta version of the enhanced BCPM, as described in these and earlier comments, will be filed with the Commission.

II. BCPM ENHANCEMENTS

Prior to addressing the specific questions posed by the Commission in its Further Notice of Proposed Rulemaking, the Joint Sponsors offer the following description of the enhancements made to BCPM with respect to the loop module.

A. Purpose and Overview

The loop module is designed to develop the loop costs associated with providing basic telephone service. As indicated in our response to the FCC's Further Notice of Proposed Rulemaking regarding Customer Location, the enhanced BCPM integrates more precise information regarding customer location with a customer location algorithm that establishes an optimal grid size based on an efficient network design, subject to technological constraints.[1] Thus, the optimal grid size is determined by adhering to sound engineering practices that reflect forward looking, least cost technology for providing basic service. The ultimate grids comprising a wire center can vary in size between 1/200th of a degree latitude and longitude (approximately 1,500 feet by 1,700 feet) and 1/25th of a degree (approximately 12,000 feet by 14,000 feet.) The ultimate grids may be designated a Carrier Serving Area (CSA) and may include a digital loop carrier (DLC). However, all grids contain the requisite feeder distribution interfaces (FDIs) and distribution areas (DAs).

Once the CSA or ultimate grid size has been established, the enhanced BCPM maintains certain features of the loop engineering design in BCPM1.1. However, significant changes have been made to BCPM 1.1 loop engineering to increase network efficiency. Specifically, BCPM 1.1 squared the area encompassed by a CBG and reduced the size (the size was reduced only for those CBGs with a line density of less than 20/sqmi) of that square based on the area included within a 500 foot road buffer on each side of roads within the CBG. BCPM1.1 designed outside plant based on the assumption that customers were uniformly distributed throughout that road reduced area. The enhanced BCPM has abandoned the assumption that all customers are uniformly distributed. The enhanced BCPM's customer location algorithm uses housing and business line data at the Census Block (CB) level combined with information regarding the road network to more precisely locate customers, thereby identifying clusters of customers where they are indeed clustered, and sparsely populated areas where customers are, in fact, dispersed. This is all done while still retaining the shape and relative cable design of the wire center territory.

[1] See "Joint Comments of BellSouth Corporation, BellSouth Telecommunications, Inc., US WEST, Inc., and Sprint Local Telephone Companies to Further Notice of Proposed Rulemaking Sections III.C.1", CC Docket No. 96-45 and CC Docket No. 97-160, filed September 2, 1997.

Major changes to the BCPM1.1 loop engineering include:

- directing main feeder toward population clusters, where appropriate;
- sharing of subfeeder, where appropriate;
- placing the DLC at the road centroid of the grid;
- creating quadrants within the engineering area;
- running horizontal and vertical cables from the DLC site to each distribution area;
- placing the FDI at the road centroid of the quadrant where appropriate;
- allowing the DA to vary in size; and
- permitting empty quadrants within grids, where appropriate.

The engineering protocols most central to the design of this model include an average maximum copper-only loop length less than 12,000 feet; individual customer loops containing no more than 18,000 feet of copper (if one were to model copper beyond 18,000, copper loops must be loaded or electronically extended-at a great cost); and compliance with standard Lucent, RUS, and U.S. companies' practices covering loop resistence and dB loss. By employing these protocols, the enhanced BCPM assures that the designed network meets expected USF service specifications.

B. Methodology

(i) Depiction of the Served Area

The goal in developing a description of the area being served is to identify and describe as closely as possible the location of customers within that wire center area, and to make the description and location as pertinent as possible to the task of building a network. The availability of relevant and usable data is the principal frustration in completing this task.

With respect to the enhanced BCPM model, this process begins with a definition of the wire centers' boundaries using data supplied by Business Location

Research. CB information including data on households, businesses, dwelling units and terrain is then overlaid on the wire center map. Finally, a 1/200 degree latitude/longitude grid complex and road network information is overlaid.

With this information in place, the data is partitioned into the 1/200 degree grids using road information where appropriate.[2] The BCPM then determines the proper combination of these grids into engineering units.[3] In general, grids will vary in size to mimic engineering CSA/DA (Carrier Serving Area/Distribution Area) architecture. Although grid size and line counts may vary based on the unique characteristics of the grid, each grid is designed to capture approximately 1,000 housing units and business lines, yet is constrained in size so that copper loops would never exceed the stated maximum of 18,000 feet. For example, a grid in a city can be as small as approximately 1,500 feet by 1,700 feet. In rural areas, the grid can increase in size up to a maximum of approximately 12,000 feet by 14,000 feet. (An example of a grid system for Red Oak, Iowa can be seen in Attachment A, Exhibit 1.)

Within the larger grids, (actually all grids except the 1/200 degree grid), data will be retained to identify the unique characteristics of each quadrant within the grid. This grid and quadrant system, utilizing actual customer information, is the foundation that permits the analyst to design an efficient network, minimizing the possibility of either over or under building facilities.

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[2] For CBs less than ¼ square mile in area, the relative area of the CB in the overlaying grids is teh basis for allocation. For CBs greater than ¼ square mile in area, the relative road length of the CB in the overlaying grid is the basis for allocation. If the CB is void of lines (no housing units or business lines), the road information is omitted from further processing.

[3] See, Joint Comments of BellSouth Corporation, BellSouth Telecommunications, Inc., US WEST, Inc. and Sprint Local Telephone Companie to Further Notice of Proposed Rulemaking Sections III.C.1, filed September 2, 1997, in the instant docket.

(ii) **Network Design: the Feeder System**

The first step in designing the network is to create the feeder cable routes. Beginning at the central office, a maximum of four main feeder[4] routes run north, east, south and west. These routes run for 10,000 feet. This is based on the assumption that within 10,000 feet, customers are generally located within the perimeter of a town and that the town has some sort of gridded street complex. However, beyond 10,000 feet, the direction of each main feeder will be determined by customer concentrations as reflected in the grid information data.

If the line count in the center 1/3 of the section is greater than 30% of total section lines, this feeder will remain a single feeder and will be pointed to the population centroid of the entire quadrant. The 30% figure is used to determine whether there is enough line demand in the middle to support the economics of a single feeder. (An example of this is shown on the north directed main feeder in Attachment A, Exhibit 2).

If the line count in the center 1/3 of the section is less than 30% of total section lines, the feeder will split into two main feeders each pointed at the population centroid in one half of the quadrant. This breakpoint should capture the need to split the cable to avoid any natural barriers. (Examples of split feeders are shown on the west and south directed main feeders in Attachment A, Exhibit 2). The length of the main feeder(s) will be limited to the minimum distance necessary to reach the last subfeeder.

(iii) **Subfeeder Design**

From the main feeder a series of subfeeders branch out toward the individual distribution areas. The location of subfeeders is determined by the line population to

[4] There is no requirement for four main feeders. If due to the shape of the wire center territory four feeders are not necessary, only the required number of feeders will be designed.

be served by the subfeeder. Subfeeders can be shared by more than one grid.

For a main feeder within 10,000 feet of the wire center, subfeeders may run between every 1/200 degree boundary. Ideally, the subfeeder runs up or down or horizontally to minimize the distance of the grid centroids to the subfeeder cable. If there are no grids to serve from this cable, the cable will not show up in any record.

For a main feeder beyond 10,000 feet of the central office ("CO"), the subfeeder will run, at most, once between every 1/25 degree boundary. Ideally, the subfeeder runs up or down or horizontally to minimize the distance to all the grids in the 1/25 degree swatch.

For a single main feeder, subfeeder runs off the main feeder vertically in east and west quadrants, and horizontally in north and south quadrants. (See Attachment A, Exhibit 2, the north directed feeder). For a split main feeder, subfeeder will emanate in a vertical and horizontal direction, away from the CO, creating a fishbone pattern. (See Attachment A, Exhibit 2, the west and south directed feeders).

Within each grid, a DLC (if served by fiber) or a cross connect (if served by copper) is established at the road centroid for that grid. A part 2 subfeeder will link the subfeeder to the road centroid.

BCPM includes a series of rules to make this determination. In general, road centroids that fall within either the 1/200 degree boundary within 10,000 feet of the central office or the 1/25 degree boundary outside of the 10,000 feet distance to the central office are served off of a shared subfeeder. If no road centroid exists along the subfeeder route, no subfeeder is extended.

The demarcation between classification of feeder and distribution is based on the location of the FDI. The location of the FDI is determined by the number of grid lines served. An FDI is placed in each quadrant. If there is no population in a particular quadrant, no plant is provided. All cables connecting remote FDIs to the

DLC are considered feeder, and any facilities beyond the FDI are categorized as distribution plant.

(iv) Data Input File

All of the work creating the grid system and the feeder routes is done outside the BCPM model using a combination of Mapinfo and C+ software. At this point, the data input file is prepared summarizing information about the grid layout and main feeder, subfeeder and subfeeder part 2 design and distances. When the enhanced BCPM is run, the feeder plant is sized, tapered, and the cost determined. The model then designs, builds, sizes, and assigns costs to the distribution plant plan.

(v) Distribution Plant Design

To design the distribution plant, quadrants are created in each grid using highly detailed data that include information on building type, dispersion, and clustering as well as unbuilt areas. These quadrants are defined by the point at which the road centroid of the grid falls. Once the quadrant is formed, the data within the quadrant is used to size the appropriate distribution area. Using a buffer of 500 feet about the roads, the road reduced area of each quadrant is calculated. These road reduced areas are squared in shape and centered about the road centroid[8] of each quadrant. This design is referred to as the "Floating Distribution Area". Within each of these floating squares, all the quadrant customer data (housing units, business lines, buffered road area, and road length) is passed to the distribution algorithms for cable design.

The FDIs are located at the road centroid of the road reduced cluster for non-empty quadrants. This is tantamount to placing the FDI at the center of the DA.

Within a road reduced DA, the vertical connecting cable extends to the center of the road reduced quadrant area. From that point, backbone cable will emanate up and down the center of the DA with branch cable running from the backbone to each site, or along every other lot line (see Attachment A, Exhibit 3).

Finally, once the cable routes and numbers are determined, the model user can either set the number of wire pairs per building or can accept the model default minimums of 2 pair for a resident unit and 6 pair for a business unit (or the actual number of business lines if available in the data.) Using this design criteria, proper cable sizing can then be determined. In addition to this design criteria, the cables are sized to account for administrative needs and the ability to meet minimum service standards. This is done via the cable sizing factors.

(vi) Distribution Equipment

Within the model there are a number of rules that are used to select specific pieces of equipment to be used in the distribution plant. Among those rules with the most impact are:

- Within a grid, if the length of copper to the last lot in the quadrant exceeds 12,000 feet, 24 gauge wire is used in all cables to and within the quadrant (although this will be rare because of the design of the grid system).
- The mix of aerial, buried and underground facilities is determined by terrain and density specific to that grid.
- Terminals
    - Exterior terminals are provided at each point where drops connect to branch cables and are sized for the number of connecting drops.
    - Branch terminals are placed on each multi-tenant building and business locations are sized for the number of lines terminated at that location.

[5] The road centroid is a point that represents the weighted average of the length of the roads within the defined area.

- Different Network Interface Devices (NIDs) are used for business and residence locations. One housing is included for each drop terminated, in addition to one protector and one interface per drop pair terminated.
- Terminal cost input tables include entries for separate components of the installation process.

- Cables are sized using the following basic rules:
  - Branch cables are sized to the number of pairs for housing units and business locations. (This calculation takes the number of housing units times pairs per housing unit and business locations times the greater of actual business pairs per location or six pairs per location.)
  - Each backbone cable is sized to carry 1/2 of the branch cable pairs to the FDI.
  - Cables throughout the feeder system are sized based on the actual number of pairs used from the FDI back to the switch.

III. COMMENTS ON THE FURTHER NOTICE OF PROPOSED RULEMAKING

In response to the Commission's specific questions on outside plant investment, the Joint Sponsors offer the following comments:

A. PLANT MIX

The Commission tentatively concludes that the assignment of plant mix defined by the selected mechanism should reflect both terrain factors and line density zones. Specifically, the Commission concludes that relatively more feeder and distribution cable should be assigned to aerial installation for all population density groups in wire centers characterized by "hard rock" conditions than those in wire centers with other terrain conditions (para. 58).

Comment:

The enhanced BCPM design conforms with the Commission's tentative conclusion that the assignment of plant mix should reflect both terrain factors and line density zones. The enhanced BCPM utilizes tables that allow the user to adjust the plant mix assignments based on density zones. Moreover, these same tables permit adjustments for the existence of hard rock, soft rock or normal terrain, recognizing that hard rock in the terrain should increase the percentage of aerial plant.

BCPM does not currently utilize climactic conditions in its calculations. However, the effect of climate is realized in three areas of plant cost. First, is the length of the plant construction period. In colder climates, such as northern New England and the upper mid-west and great plains, the construction season is considerably shorter than in warmer areas of the country. This shortened construction season can create difficulties in meeting current demand growth and plant rehabilitation needs. Because the Universal Service Fund proxy models place all new plant instantaneously, the costs created by this shortened construction period cannot theoretically be captured.

Second, maintenance costs are adversely impacted by adverse weather conditions such as ice storms, flooding and tornadoes. However, the costs caused by these climatic conditions can be captured in state or area-specific maintenance costs. Therefore, this issue is more properly addressed in the analysis of model inputs. Finally, weather impaired areas experience increased construction costs due to differing construction patterns (e.g., more buried in coastal areas to avoid hurricane damage, the space left between poles in the snow-belt states is typically shorter than that in desert states in order to account for snow and ice on the cables). Adjustments for these costs must be made on an area-by-area basis. However, the Joint Sponsors currently have neither the data identifying weather impaired areas, nor the amount of adjustment needed in the input data to account for the weather.

B. INSTALLATION AND CABLE COSTS

The Commission tentatively concludes that the selected mechanism should specify costs for installation of aerial cable, buried cable, and underground cable that incorporate terrain factors and line density zones (para. 65).

Comment:

The Joint Sponsors partially agree and partially disagree with the Commission's tentative conclusion that installation costs for various types of plant should reflect both terrain factors and line density zones. The enhanced BCPM has been modified to allow a user to reflect these differences. However, the Joint Sponsors agree that total construction costs may vary by density and terrain. We are not sure that installation cost varies in the same manner.

The selected mechanism should adopt BCPM's approach of prescribing additional costs to account for additional expenses caused by the difficult terrain, rather than Hatfield's approach of using cost multipliers (para. 66).

Comment:

The Joint Sponsors concur with the proposed conclusion that the adopted model should account for difficult terrain by adding specific costs. Both the previous version and the enhanced version of BCPM utilize this technique.

Because it appears that each census-defined household does not necessarily have a single telephone line, the Commission notes its belief that the number of lines per square mile more accurately measures the line density of a local telephone system than the number of households per square mile. Therefore, it is tentatively concluded that the mechanism should define density zones based on lines per square mile (para.67).

Comment:

The Joint Sponsors concur with the Commission's tentative conclusion that density zones should be based on lines per square mile rather than households per square mile, and that density should play a role in determining the costs for conduit installation. The enhanced version of BCPM employs this methodology. While continuing to believe that the density zones used in BCPM are appropriate, the Joint

Sponsors have endeavored to improve the consistency between the Hatfield and BCPM models, and further, to simplify the review of the model outputs, by conforming the BCPM density zones to parallel those used in the Hatfield model.

The Commission tentatively concludes that material and installation costs should be separately identified by both density zone and terrain type (para. 68).

Comment:

Although the majority of the issues raised in this paragraph deal with input values, and while those issues will be addressed, the Joint Sponsors wish to point out that an additional table has been inserted into BCPM to address the issue of density.

While the Commission is correct that the use of a national average for contractor prices would clearly yield consistent rates for the nation, the Joint Sponsors suggest that, instead, regional[6] or state averages be utilized. Using regional or state averages will more accurately reflect the very significant differences that exist in regional labor rates. As the Commission is aware, labor is a significant cost element and, because labor rates can vary widely, a more precise input would yield a better targeted subsidy.

Because, at the time of the FNPRM, the Commission had received no documentation confirming that feeder and distribution cable installation costs should differ, it tentatively concluded that the selected mechanism will adopt Hatfield's assumption that such costs are identical (para. 69).

Comment:

The Joint Sponsors strongly disagree with the tentative conclusion that feeder and distribution cable installation costs are identical. The cost to place feeder cable into the ground along a road is not the same as the cost to bury cable in the more heavily populated neighborhoods where many more obstacles to construction exist. Moreover, distribution cable is never as accessible as feeder cable. For these reasons,

[6] It should be noted that differentials also exist within regional and even within state areas (e.g. New York City labor rates versus Elmira, New York labor rates).

the Joint Sponsors believe that the costs of distribution and feeder cable cannot be the same. However, while not agreeing with the Commission's conclusion, the Joint Sponsors have decided to load into BCPM's tables the same costs for feeder and distribution cable.

C. ***DROPS***

Should the selected mechanism estimate drop lengths or should it incorporate predetermined drop length assumptions (para 74)?

Comment:

The Joint Sponsors submit that there must be options for drop lengths. Lot sizes and setbacks vary, and, therefore, drop lengths must vary as well. The adopted model must reflect those varying lengths; the methodology used in the current and enhanced versions of the BCPM provide a reasonable method for calculating this distance. The BCPM methodology assumes that drop lengths are dependent on the size of the lot while, at the same time, limiting this drop length to a maximum of 500 feet.

The Joint Sponsors assert that the assumed lengths employed by the Hatfield model are too short. For instance, along Hatfield's imaginary road cables, it is assumed that all customers connections are located 150 feet from the cable. In a further distortion of reality, Hatfield assumes that, even in a town where all customer locations are situated on three acre lots, the customer connections are located only 150 feet from the cable. As the Commission no doubt agrees, such a scenario is unrealistic, to say the least. Using the outputs from Hatfield would, therefore, result in a significant underestimation of the realities of the less-than-ideal world.

D. ***STRUCTURE SHARING***

The Commission tentatively concludes that the selected mechanism should adopt BCPM's categories for installation activities and terrain conditions. Further, it is tentatively concluded that the selected mechanism should also include line density zone in its estimates of sharing and specifically, whether it should use Hatfield's line density zones for that purpose (para. 79).

Comment:

As mentioned earlier, the enhanced BCPM has already been altered to utilize the line density zones of the Hatfield model.

It has been tentatively concluded that the selected mechanism will assign 100 % of cost to the telephone company for cable that is buried using a cable plow (para. 80).

Comment:

The Joint Sponsors agree that 100% of plow-buried cable costs should be assigned to telephone costs. Both the early and enhanced versions of BCPM account for such an assignment. While we do agree that structure sharing occurs in some instances (predominately in the case of distribution plant for new subdivisions), we do not agree with the unrealistically optimistic sharing assumptions of the Hatfield model.

Will changes in the regulatory climate affect carriers' willingness to share structures in the near term, or will such changes have no significant impact on carriers' decisions for a significant time into the future (para. 82)?

Comment:

The Joint Sponsors believe that most telecommunications firms have always had economic incentives to share the costs of plant placement. Regulatory frameworks - such as rate of return or price cap - have never provided a source of unlimited capital for local exchange companies to develop all the capital construction projects for meeting their network needs. Given that all carriers face capital budget constraints, it seems a safe assumption that no carrier would pass on an opportunity to share the cost of construction. However, the sharing of these costs is a possibility, then the additional costs of construction coordination - including delays which occur as the result of the need to wait for a construction partner to obtain materials - must be considered. The cost of these delays can exceed the cost of placing plant without sharing.

Both the current and enhanced versions of BCPM reflect the forward looking opportunities to share construction activities. The Joint Sponsors caution, however, that it will take a significant number of years to increase sharing opportunities to the levels suggested by the Joint Board. These opportunities will first manifest themselves in the densest metropolitan areas while outlying areas lag well behind.

E. LOOP DESIGN

The Commission tentatively concludes that BCPM's maximum cross-over default should be set at 18,000 feet rather than 12,000 feet. Moreover, comment is sought on whether the BCPM fiber/copper cross-over point can also be set at 18,000 feet when the copper loop length is extended to 18,000 feet. Finally, it is tentatively concluded that BCPM's approach of installing optical fiber in the network to avoid loading coils should be adopted (para. 87).

Comment:

As the Joint Sponsors have stated numerous times and as have other parties stated the optimal breakpoint for 26 gage copper is 12,000 feet. Given the mix of services provided by telephone companies, 12,000 feet is the electrical limitation of 26 gage copper. Service standards cannot be met beyond that point. If one wants to consider other breakpoints, copper gage and the costs must be adjusted. However, to avoid load coils, 18,000 feet is the maximum. A loop design is not created merely for the sake of the design; rather, it is established for the purpose of providing certain services, at a certain level of blockage, with a certain level of signal distortion. Consequently, it makes no difference whether a design standard or a performance standard is chosen as long as the selection is made in direct linkage with those services that have been designated as those which should be eligible for universal service. The standards chosen should accurately reflect only that which is required by the universal service obligations. The Joint Sponsors have endorsed the CSA standards which are also the design standards that RUS adheres to for rural areas.

Care must be taken in choosing the standards in the costing model. Since these standards will define, in part, the level of compensation which network providers will receive, they will impact the standards for future network construction. This will be the result since the network providers will not construct facilities for which they do not expect a reasonable return on their investment.

What assumptions should be made regarding the number of subscriber lines that should trigger the use of a large DLC? Also, should the models consider the use of DLCs of more than two sizes; particularly, whether DLCs smaller than those used in the model are available and under what circumstances such smaller DLCs might be used (para. 93).

Comment:

The Joint Sponsors' approach has been to trigger the use of the larger types of DLC based on the availability of sizes from the vendors. Although easily changed, that trigger is currently set at 240 lines. The trigger may be changed in the new model. However, the BCPM has never limited the options to only two sizes. Within the two *types* - - large type and small type - - there are multiple size options. In the previous version of BCPM, the smaller DLC options reflect three sizes of remote terminals serving up to 48, 120, and 240 lines, The large DLC options include two sizes of remote terminals serving up to 672 and 1344 lines respectively. The enhanced version includes even more size options.

The Commission seeks comment on whether models should extend fiber into fewer points within the CBG, placing larger DLCs at these points, and running copper to customers, including the possible additional cost of repeater electronics on the longer copper loops. The Joint Sponsors posit that this proposal is neither forward-looking nor economically sound, given the basic assumption in the forward-looking model that all outside plant is rebuilt. The costs associated with extending copper plant for providing voice grade service with technologies such as HDSL loop extensions make economic sense when used for upgrading and extending the capabilities of an existing copper network. However, if one were to design a new network, small fiber driven remote terminals provide the most forward-looking flexibility at the least cost. The fiber-driven remote terminals are more cost effective for two reasons:

1. The placement cost of fiber cable and copper cable are not significantly different, and
2. HDSL loop extension costs include a portion of the cost of a large fiber-driven DLC remote containing HDSL plug-in modules, a DS1 cross-connect repeater shelf; mid-span HDSL repeater equipment; and an additional copper driven remote terminal with an HDSL to DS1 conversion plug-in module, as well as a DS1 to voice grade conversion plug-in module.

Requiring the conversion of the optical signal from HDSL to DS1 to voice grade creates additional costs, as does the mid-span repeater equipment. These costs make loop extension methods such as HDSL more expensive than small fiber-driven DLC remotes - especially in rural areas - when studying them in a forward-looking cost environment where all outside plant is newly placed. This does not suggest that, in actual practice, where carriers have existing copper facilities that using loop extension technology is not more economical. Obviously, in this case, the cost of placing a fiber facility, where copper already exists, outweighs any savings on electronics. However, this is not the network being studied in the forward-looking proxy models.

F. WIRELESS

Comment:

The Joint Sponsors have no knowledge of existing technology that will address the needs of a wireless solution. The BCPM1.1 had the capability of invoking a cap on the cost of a loop should the user choose to do so. The creation of the cap in BCPM 1.1

was not an attempt to specify the cost of a wireless solution, but rather, was merely an attempt to recognize the potential of such a solution.

G. *MISCELLANEOUS OSP INPUT VALUES*

It is tentatively concluded that the selected mechanism should include feeder and distribution cable costs for both copper and fiber (para. 113).

Comment:

The Joint Sponsors agree with the tentative conclusion that both feeder and distribution costs should include the costs of both copper and fiber. The BCPM has provided the logic to handle both.

The Commission tentative concludes that the cost of protection blocks should be separated from the costs of the NID, and distinguish between the cost of residential NID and a business NID (para. 115).

Comment:

The Joint Sponsors agree with the tentative conclusion that the cost of protection blocks should be separated from the cost of the NID, and that residential NIDs are different from business NIDs. It should be noted, however, that BCPM already reflects not only these distinctions, but also separates the cost of the interface. Thus, BCPM has a six way separation - protector, block, and interface split by both residential and business.

The Selected mechanism should include the cost of Service Area Interface for various cable sizes and should assume different cost for indoor and outdoor cable (para. 117).

Comment:

The Joint Sponsors agree that there are different costs for indoor and outdoor cable. BCPM currently has this distinction built into its logic and furthermore, provides variations by cable size.

The previous version of the BCPM recognized multiple sizes of feeder/distribution interfaces (serving area interfaces) and also included building terminals (that also contain protector devices). Conversely, the Hatfield description of indoor SAIs appears to be a building terminal without protection. Regardless of the nomenclature, the BCPM properly terminates plant to larger multi-tenant buildings utilizing distribution (or in dense urban areas, feeder cable) terminating at the building terminal, where the building owner's cable or wiring begins.

IV. CONCLUSION

The Joint Sponsors hope that these comments and model description will assist the Commission in its task of choosing the appropriate model design for outside plant investment.

Respectfully submitted,

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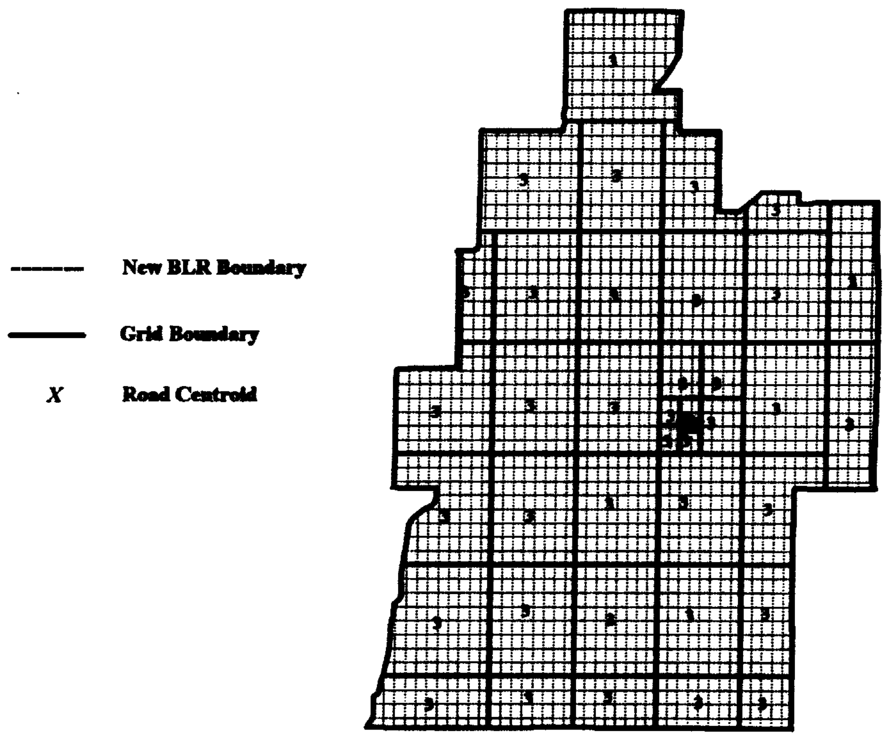
ATTACHMENT A

ILLUSTRUTATIVE FIGURES

BCPM Enhanced Loop Engineering

- Variable Size Grids for Red Oak, Iowa



BCPM Enhanced Loop Engineering

- Feeder Engineering Visualization